Remarks

Claims 1-5 are pending herein. By this Amendment, the Abstract of the Disclosure, the specification, and claims 1-3 have been amended.

The Abstract of the Disclosure has been amended to overcome an objection thereto, as discussed below.

The specification has been amended to correct minor typographical errors.

Claims 1-3 have been amended in part to overcome a rejection under 35 U.S.C. §112, discussed in detail below.

Claim 1 has been further amended to recite that the cutting tool has a cutting blade. Support for this feature can be found in the specification at, for example, page 6, lines 19, 24 and 30; page 7, lines 4, 10, and 14-16; page 13, lines 25-26; and page 14, line 2.

In the Office Action, the Abstract of the Disclosure is objected to; claims 1-5 are rejected under 35 U.S.C. §112, second paragraph; claims 1-3 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0004359 to Arai ("Arai"); and claims 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arai.

In view of the amendments and remarks herein, Applicants respectfully request reconsideration and withdrawal of the rejections and objection set forth in the Office Action.

I. Objection to the Abstract of the Disclosure

The Abstract of the Disclosure is objected to because it contains legalese such as "means" or "said". By this Amendment, the Abstract of the Disclosure has been amended to delete legalese therefrom. Thus, Applicants respectfully request that the objection be withdrawn.

II. Rejection of Claims 1-5 Under 35 U.S.C. §112

Claims 1-5 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

The Office Action sets forth suggested amendments to claims 1-3 that would overcome the §112 rejection. By this Amendment, claims 1-3 have been amended in accordance with the Examiner's suggestions. Accordingly, Applicants respectfully request that the §112 rejection be withdrawn.

III. Rejection of Claims 1-3 Under 35 U.S.C. §102(b)

Claims 1-3 are rejected under 35 U.S.C. §102(b) as being anticipated by Arai.

As noted above, claim 1 has been amended to recite that the cutting tool has a cutting blade. Arai does not disclose a cutting tool having a cutting blade. Therefore, for at least this reason, Applicants respectfully submit that claims 1-3 are not anticipated by Arai.

IV. Rejection of Claims 4 and 5 Under 35 U.S.C. §103(a)

Claims 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arai.

Applicants respectfully submit that Arai would not have rendered claims 4 and 5 obvious.

Claim 4 depends upon claim 1, and claim 5 depends upon claim 4. Thus, claims 4 and 5 both include the limitation of the cutting tool having a cutting blade. As pointed out above, Arai does not disclose a cutting tool having a cutting blade.

The instant specification teaches that:

> Since in the above technologies, a plurality of protuberant bumps (electrodes) are formed on front surfaces of the substrates of semiconductor chips and the substrates are bonded to each other through the protuberant bumps (electrodes), ***the protuberant bumps (electrodes) must be made uniform in height.*** To realize this, ***grinding*** is generally used. ***However, when the bumps (electrodes) are ground, burrs are produced if the bumps (electrodes) are made of a sticky metal such as gold, thereby causing a problem that a short circuit occurs between adjacent bumps (electrodes)***. [emphasis added] (page 1, lines 24-33).

Thus, grinding electrodes made of a sticky metal can cause burrs to form which in turn may cause short circuits between adjacent electrodes. Accordingly, grinding is not preferred. Arai discloses that the semiconductor wafer therein is ground. The grinding means includes a rough-grinding unit 10 and a finish-grinding unit 12. The rough-grinding unit 10 has a grinding wheel 102, and the finish-grinding unit 12 has a grinding wheel 122 (see paragraphs [0023] and [0024]).

An object of the instant invention is "to provide a processing machine capable of easily making a plurality of electrodes projecting from the front surface of a plate-like workpiece ***uniform in height, without causing a short circuit . . . between adjacent electrodes***" [emphasis added] (page 2, lines 21-25).

As discussed above, the cutting tool in Applicants' claimed machine has a cutting blade. The instant specification teaches that:

> By the rotation of the semiconductor wafer 10 and the rotation of the cutting tool 33, the top end portions of the plurality of stud bumps (electrodes) 120 formed on the front surfaces of the semiconductor chips 110 of the semiconductor wafer 10 are cut away to make the stud bumps 120 uniform in height as shown in Fig. 13 (page 14, lines 9-14).

Cutting tool 33 has a cutting blade 332 (page 14, line 2).

According to the instant specification:

> Since in the processing machine constituted according to the present invention as described above the end portions of the electrodes projecting from the front surface of the plate-like workpiece are cut away, ***the electrodes can be made uniform in height without causing a short circuit*** (page 15, lines 9-13) [emphasis added].

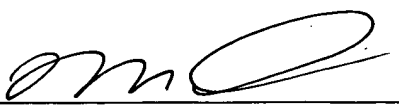
In view of the advantages associated with the use of a cutting tool having a cutting blade and the failure of Arai to teach such a cutting tool, Applicants submit that Arai would not have rendered instant claims 4 and 5 obvious.

V. Conclusion

In view of the amendments and remarks herein, Applicants respectfully request that the objection and rejections set forth in the Office Action be withdrawn and that claims 1-5 be allowed.

If any additional fees under 37 C. F. R. §§ 1.16 or 1.17 are due in connection with this filing, please charge the fees to Deposit Account No. 02-4300, Order No. 033773M067.

Respectfully submitted,
SMITH, GAMBRELL & RUSSELL, LLP

By: 

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Enclosures: (1) Petition for Extension of Time (One Month)
(2) Check for the sum of $120

MAM/MM/cj